

**AMENDMENTS**  
**In the Claims**

**Current Status of Claims**

1      1.(**currently amended**)      A method of improving coronary calcium imaging-based cardiac risk  
2      assessment ~~implemented in a computer~~ comprising:

3           a.      scanning a region of interest in a patient using computed tomography (CT);  
4           b.      storing CT generated data resulting from said scanning, the data comprising  
5           calcification data as CT generated images;  
6           ca.      analyzing the CT generated images to determine a location, heterogeneity, shape,  
7           size, texture, and density gradient of each calcified spot in a patient's heart;  
8           db.      analyzing the CT generated images to determine a scatterness and a pattern of the  
9           multiple calcified spots;  
10           ec.      defining a risk score based on the analyzing step ac and/or the analyzing step bd  
11           and  
12           fd.      assessing the a patient's risk of cardiovascular disease based upon said analyzing  
13           the risk score.

2.(**canceled**)

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32.(canceled)  
33.(canceled)  
34.(canceled)

1       35.(currently amended)   The method of claim 1, further comprising  
2                    ge.    categorizing an area of an abrupt change in regional coronary elasticity as a high-risk  
3                    region.

1       36.(previously presented)   The method of claim 1, wherein each location comprises a distance  
2                    from a base or apex of the patient's heart and proximal or distal segment of coronary arteries.

1       37.(previously presented)   The method of claim 1, wherein each heterogeneity comprises variance  
2                    in calcium densities with its spot.

1       38.(previously presented)   The method of claim 1, wherein each shape comprises a circular or  
2                    angular spot having concentric or eccentric character.

1       39.(previously presented)   The method of claim 1, wherein each texture comprises a smooth or  
2                    rough texture.

1       40.(previously presented)   The method of claim 1, wherein each density gradient comprises a  
2                    higher density core or a higher density outer ring.

1       41.(previously presented)   The method of claim 1, wherein the scatterness comprise interspot  
2                    distance and the pattern comprises variance of calcium densities among two or more spots.

1       42.(previously presented)   The methods of claim 1, wherein the CT generated images are  
2                    generated by electron beam computed tomography (EBCT) or multi-detector spiral CT (MDCT).

1       42.(previously presented)   The methods of claim 1, wherein the analyzing steps utilizes statistical  
2                    determinants including mean, median, mode, standard deviation, range, coefficient of variation,  
3                    skew, or kurtosis, or a combination thereof.

1       43.(currently amended)   A method for improving coronary calcium imaging-based cardiac risk  
2                    assessment, ~~implemented in a computer~~ comprising:  
3                    a.       scanning a region of interest in a patient using computed tomography (CT) at a first  
4                    time;

5           b.     storing first CT generated data resulting from the first scanning, the data comprising  
6           calcification data as first CT generated images;  
7           c.     later scanning a region of interest in a patient using computed tomography (CT) at  
8           at least one later time;  
9           d.     storing later CT generated data resulting from the later scanning, the data comprising  
10           calcification data as later CT generated images;  
11           ea.    analyzing the two or more sets of CT generated images of a patient obtained at the  
12           two or more times points to determine changes in a location, a heterogeneity, a shape,  
13           a size, a texture, and a density gradient of each calcified spot in the patient's heart;  
14           fb.    analyzing the two or more sets of CT generated images of the patient obtained at the  
15           two or more time points to determine changes in a scatterness and a pattern of  
16           multiple calcified spots;  
17           ge.    defining a risk score based the analyzing step ae and/or the analyzing step bf; and  
18           hd.    assessing the a patient's risk of cardiovascular disease based upon said analyzing the  
19           risk score.

1       **44.(previously presented)**   The method of claim 43, further comprising  
2           e.     using the changes in calcification density, heterogeneity, shape, size, texture, and  
3           density gradient to assess the patient's risk of cardiovascular disease by relating the  
4           changes in calcified spots to an outcome of a lesion.

1       **46.(previously presented)**   The methods of claim 43, wherein the analyzing steps utilizes  
2           statistical determinants including mean, median, mode, standard deviation, range, coefficient of  
3           variation, skew, or kurtosis, or a combination thereof.

1       **47.(previously presented)**   The method of claim 43, wherein each location comprises a distance  
2           from a base or apex of the patient's heart and proximal or distal segment of coronary arteries.

1       **48.(previously presented)**   The method of claim 43, wherein each heterogeneity comprises  
2           variance in calcium densities with its spot.

1       **49.(previously presented)**   The method of claim 43, wherein each shape comprises a circular or  
2           angular spot having concentric or eccentric character.

1       **50.(previously presented)**   The method of claim 43, wherein each texture comprises a smooth or  
2           rough texture.

1       **51.(previously presented)**    The method of claim 43, wherein each density gradient comprises a  
2        higher density core or a higher density outer ring.

1       **52.(previously presented)**    The method of claim 43, wherein the scatterness comprise interspot  
2        distance and the pattern comprises variance of calcium densities among two or more spots.

1       **53.(previously presented)**    A method of mapping comprising:  
2                forming a map of a plurality of sections of coronary vessels as a function of the statistical  
3                distribution of heterogeneity, shape, size, texture, and density gradient of calcified spots in each  
4                sections, where the map is used to determine a progression of plaque and to categorize a patient's risk  
5                of cardiovascular disease.